
Identification of functional progenitor cells in the pulmonary vasculature.

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Public Summary:

The pulmonary vasculature comprises a complex network of branching arteries and veins all functioning to reoxygenate the blood for circulation around the body. The cell types of the pulmonary artery are able to respond to changes in oxygen tension in order to match ventilation to perfusion. Stem and progenitor cells in the pulmonary vasculature are also involved, be it in angiogenesis, endothelial dysfunction or formation of vascular lesions. Stem and progenitor cells may be circulating around the body, residing in the pulmonary artery wall or stimulated for release from a central niche like the bone marrow and home to the pulmonary vasculature along a chemotactic gradient. There may currently be some controversy over the pathogenic versus therapeutic roles of stem and progenitor cells and, indeed, it is likely both chains of evidence are correct due to the specific influence of the immediate environmental niche a progenitor cell may be in. Due to their great plasticity and a lack of specific markers for stem and progenitor cells, they can be difficult to precisely identify. This review discusses the methodological approaches used to validate the presence of and subtype of progenitors cells in the pulmonary vasculature while putting it in context of the current knowledge of the therapeutic and pathogenic roles for such progenitor cells.

Scientific Abstract:

The pulmonary vasculature comprises a complex network of branching arteries and veins all functioning to reoxygenate the blood for circulation around the body. The cell types of the pulmonary artery are able to respond to changes in oxygen tension in order to match ventilation to perfusion. Stem and progenitor cells in the pulmonary vasculature are also involved, be it in angiogenesis, endothelial dysfunction or formation of vascular lesions. Stem and progenitor cells may be circulating around the body, residing in the pulmonary artery wall or stimulated for release from a central niche like the bone marrow and home to the pulmonary vasculature along a chemotactic gradient. There may currently be some controversy over the pathogenic versus therapeutic roles of stem and progenitor cells and, indeed, it is likely both chains of evidence are correct due to the specific influence of the immediate environmental niche a progenitor cell may be in. Due to their great plasticity and a lack of specific markers for stem and progenitor cells, they can be difficult to precisely identify. This review discusses the methodological approaches used to validate the presence of and subtype of progenitors cells in the pulmonary vasculature while putting it in context of the current knowledge of the therapeutic and pathogenic roles for such progenitor cells.

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